Claims

1. A method of preparing an electrically conductive polymer blend, the method comprising steps of selecting at least two polymeric materials that are substantially immiscible together, mixing said polymeric materials into a blend so that at least one of the polymeric materials forms a continuous three-dimensional phase through the entire blend, and mixing an electrically conductive filler into said blend, wherein the electrically conductive filler contains a metal, and wherein the difference in surface tension between the polymeric material forming the continuous three-dimensional phase and the other polymeric materials forming the polymer blend is at least 2 mN/m.

2. A method according to claim 1, wherein the surface tension of the polymeric material forming the continuous three-dimensional phase is at least 2 mN/m higher than the surface tension of the other polymeric materials forming the polymer blend, and that the electrically conductive filler has higher surface tension than the polymeric materials forming the polymer blend.

3. A method according to claim 1, wherein the surface tension of the polymeric material forming the continuous three-dimensional phase is at least 2 mN/m lower than the surface tension of the other polymeric materials forming the polymer blend, and that the electrically conductive filler has lower surface tension than the polymeric materials forming the polymer blend.

4. A method according to claim 1, wherein at the same temperature and in some point between shear rates of about 100 and 1000 1/s, the proportion of the melt viscosity ratio to the volume ratio of the polymeric materials follows a formula

$$V_1/V_2 = K \cdot \eta_1/\eta_2$$

where V_1 = combined volume fraction of the dispersing polymeric material 1 and a conductive filler of the volume of the entire blend, V_2 = volume fraction of polymeric material 2 of the volume of the entire blend, K = factor with a value in the range $0.3 \leq K \leq 3$, η_1 = viscosity of polymeric material 1, and η_2 = viscosity of polymeric material 2.

5. A method according to claim 1, wherein the polymer blend comprises at least two three-dimensional continuous phases.

6. A method according to claim 1, wherein the electrically conductive filler contains nickel.

7. A method according to claim 1, wherein a bloc copolymer is mixed into the blend to stabilize the structure thereof.

8. An electrically conductive polymer blend, prepared by a method comprising steps of selecting at least two polymeric materials that are substantially immiscible together, mixing said polymeric materials into a blend so that at least one of the polymeric materials forms a continuous three-dimensional phase through the entire blend, and mixing an electrically conductive filler into said blend, wherein the electrically conductive filler contains a metal, and wherein the difference in surface tension between the polymeric material forming the continuous three-dimensional phase and the other polymeric materials forming the polymer blend is at least 2 mN/m.